REMARKS

Claims 1-13 and 16-35 are pending in the application after this amendment. In response to the rejection of claims 1-15, claims 1-5, 9-10, and 12-13 have been amended, claims 16-35 have been added, and claims 14 and 15 have been canceled. In the following sections of the Amendment the rejections set forth by the Examiner in the December 23, 2002 Office Action are addressed. These rejections are respectfully traversed, and detailed arguments are set forth below. Further, the claims have been amended to more clearly define the invention. Reconsideration of the claims is requested in view of the foregoing amendments and the following remarks.

Applicants have carefully considered the Examiner's remarks and the prior art cited by the Examiner in conjunction with the current Office Action. Claims 1-13 and 16-35 are now pending in the application following entry of the above amendments.

I. SPECIFICATION

A. SUBSTITUTE SPECIFICATION

Applicants filed a specification for this invention on December 26, 2001 ("original specification"). In response to the Examiner's rejection of the original specification in a July 15, 2002 office action, applicants filed a substitute specification in an amendment and response filed on October 11, 2002 ("substitute specification"). In the December 23, 2002 office action, the Examiner informed that she did not enter the substitute specification into the case as it included new matter. Specifically, the Examiner noted lines 24-25 of page 4; lines 19 ("preferably") and 26 ("optimally") of page 5; lines 9, 14, 18, and 22 of page 6; and lines 13-21 of page 7, as containing new matter.

Applicants have reviewed, and respectfully traverse the Examiner's findings of new matter in the substitute specification based on the arguments set forth below. These arguments provide evidence that the original specification clearly disclosed the subject matter contained in the substitute specification. The applicants submit that no new matter has been added in this substitute specification, and any amendments to the substitute specification as filed on October 11, 2002 are discussed below and shown in the accompanying "VERSION TO SHOW CHANGES." On this basis, applicants respectfully request that the Examiner enter the substitute specification in this case.

1. **PAGE 4, LINES 24-25**

The Examiner cited lines 24-25 of page 4 of the substitute specification as containing new matter. Page 4, lines 24-25 of the substitute specification states:

"The inside surface of the rod 14 is tapered at both ends ~~from~~ a wider diameter at the ends to a smaller internal diameter at the ~~end of the taper.~~"

Applicants submit that page 3, lines 41-43 of the original specification stated:

"[0020] ... an internal taper is machined into the lower entrance of the threaded rod, starting at the outside diameter and machining inwards to a recommended depth of 1/8"."

The applicants respectfully submit that the substitute specification is simply a rewording of the original specification and does not include any new matter.

2. **PAGE 5, LINES 17-19**

The Examiner cited page 5, lines 17-19 of the substitute specification as containing new matter. Page 5, lines 17-19 of the substitute specification states:

"The screw tight tube vice frame components may be manufactured from metal (such as aluminum, brass, steel, or iron) or any other rigid material (such as plastic, fiberglass, or lexan). Preferably, a malleable metal such as brass is used."

Page 3, lines 16-17 of the original specification stated:

"[0014] The Screw Tight Tube Vice Frame may be made of metal (such as aluminum, brass, steel, or iron) or any other rigid material (such as plastic, fibreglass, or lexan)."

Applicants respectfully submit that no further information is provided by the substitute specification; the substitute specification simply clarifies the original specification.

3. PAGE 5, LINE 26

The Examiner cited page 5, lines 25-26 of the substitute specification as containing new matter. Page 5, lines 25-26 of the substitute specification states:

"The threaded rod 14 is optimally attached to the tube vice frame 30."

Page 3, line 31 of the original specification stated:

"[0020] ... The threaded rod is attached to the tube vice frame ..."

Applicants respectfully submit that no further information is provided by the substitute specification; the substitute specification simply clarifies the original specification.

4. PAGE 6, LINES 8-9

The Examiner cited page 6, lines 8-9 of the substitute specification as containing new matter. Page 6, lines 8-9 of the substitute specification states:

"[0024] The threaded rod 14 is screwed...protrudes approximately a ½" from the front of the frame coil mounting bracket 44."

Page 4, at lines 10 and 13 of the original specification stated:

"[0025] ...hollow threaded section...protrudes approximately ½" from the bottom of the frame..."

The applicants respectfully submit that no further information is provided by the substitute specification.

5. PAGE 6, LINE 14

The Examiner cited page 6, line 14 of the substitute specification as containing new matter. Page 6, line 14 of the substitute specification states:

"[0025] If the hollow threaded rod 14 is cast as part of the frame 40, it optimally protrudes..."

Applicants respectfully submit that the use of the term "optimally" does not constitute new matter.

6. PAGE 6, LINES 18 AND 22

The Examiner cited page 6, line 18 of the substitute specification as containing new matter. Page 6, line 18 of the substitute specification states:

"[0025] ...protruding approximately ½" from the bottom of the frame 40. The same taper, preferably..."

Page 6, line 22 of the substitute specification also states:

"...the threaded rod 14 is cast or machined as part of the frame 40."

Page 4, lines 13-15 of the original specification stated:

"[0025]...protruding approximately ½" from the bottom of the frame (again, the same length as the threaded rod or cast threaded section would protrude from the frame). The same taper..."

Page 6, line 22 of the substitute specification states:

"[0026] The exterior surface of the preferably brass compression ferrule 10 is tapered on both..."

Page 4, lines 18-19 of the original specification stated:

"[0026] The compression ferrule is usually made of a flexible material (often brass). It is tapered on both ends;..."

Applicants respectfully submit that no new matter is added by the substitute specification. Rather, the substitute specification clarifies the original specification and states that aspects of the preferred embodiment are preferred.

7. PAGE 7, LINES 13-21

The Examiner cited page 7, lines 13-21 of the substitute specification as containing new matter. Page 7, lines 13-21 of the substitute specification states:

"In use, the sterilized, removable components are assembled as follows: the hollow rod 14 is screwed clockwise into the coil mounting bracket 44 on the frame 40, then the needle bar 24 is inserted through the frame 40 and attached to the armature bar 70. The tube 20 then slides over the active or distal end of the needle bar 24 and into the frame 40. The ferrule 10 slides over the tube 20 to seat against the distal end of the rod 14 and is tightened clockwise to compress the ferrule 10 against the tube 20 thereby retaining it in the frame 40. The tube grip 16 slides over the tube 20, and is secured by at least one set screw 26. The tube tip 18 is then inserted inside the distal end of the tube grip 16 and over the needle bar 24, and is secured to the tube grip 16 by at least one set screw 26."

Page 4, lines 27-32 of the original specification stated:

"[0029]When the compression nut is turned clockwise in a tightening motion, the bevels make contact and slide over each other, creating pressure on the compression ferrule and causing it to compress. The vertical slit provides greater room for compression as the ends of the slit move toward each other, creating a squeezing effect and securing the tube grip to the frame.

[0030] Turning the compression nut counter-clockwise in a loosening motion relieves the pressure on the compression ferrule, resulting in the release of the tube grip."

Applicants respectfully submit that no further information is provided by the substitute specification; the substitute specification simply clarifies the original specification.

B. PAGE 4, LINES 8 AND 12

The Examiner stated that on page 4, lines 8 and 12, "22" should be --14--. The applicants have amended the specification in accordance with the Examiner's specifications. Applicants submit that no new matter has been added in this amendment.

C. PAGE 4, LINE 15

The Examiner stated that on page 4, line 15, "26" should be --20--. Applicants have amended the specification in accordance with the Examiner's specifications. Applicants submit that no new matter has been added in this amendment.

D. PAGE 5, LINE 13

The Examiner stated that on page 5, line 13, "a1/2" should be --a 1/2--. The applicants have amended the specification in accordance with the Examiner's specifications. Applicants submit that no new matter has been added in this amendment.

E. Applicants have amended page 6, paragraph [0028.2] of the substitute specification as follows:

> "[0028.2] In use, the sterilized, removable components are assembled as follows: the hollow rod 14 is screwed clockwise into the coil mounting bracket 44 on the frame 40, then the needle bar 24 is inserted through the frame 40 and attached to the armature bar 70. The tube 20 then slides over the active or distal end of the needle bar 24 and into the frame 40. The ferrule 10 slides over the tube 20 to seat against the distal end of the rod 14 and the compression nut 12 is tightened clockwise to compress the ferrule 10 against the tube 20 thereby retaining it in the frame 40. The tube grip 16 slides over the tube 20, and is secured by at least one set screw 26. The tube tip 18 is then inserted inside the distal end of the tube grip 16 and over the needle bar 24, and is secured to the tube grip 16 by at least one set screw 26.

This amendment corrects an oversight in the substitute specification filed on October 11, 2002. This amendment does not add any new matter to the specification and is not made to address the requirements of patentability.

II. SECTION 112, SECOND PARAGRAPH

A. INDEFINITE

The Examiner rejected claims 1-15 under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicants regards as their invention. More specifically, the Examiner states: (a) claim 1, line 6, the comma "," should be changed to a period --.--since all claims must end in a period; (b) claim 2, line 2, "said tube" lacks antecedent basis; (c) claim 4, "a tapped hole" lacks antecedent basis in the specification and drawings; (d) claim 9, it is not clear if applicant is claiming a tube vice frame apparatus by itself or in combination with a tattoo machine. Also in line 5, "the active end" lacks antecedent basis"; (e) claim 10, "removable" should be --removably--; and (f) claim

13, lines 6-7, "the remaining portion" lacks antecedent basis. In line 15, "may be" is vague and indefinite since the scope cannot be determined. Applicants have amended claims 1-2, 4, 9-10, and 13 as the Examiner suggested or in a manner similar thereto. The amended claims do not contain new matter and are supported by the substitute specification filed by the applicants with this response. As amended, claims 1-2, 4, 9-10 and 13 clearly define the claimed invention, and the applicants respectfully request that the rejection under 35 USC §112 be withdrawn.

B. INCOMPLETE

The Examiner rejected claim 1 under 35 USC § 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. Specifically, the Examiner stated that the omitted structural cooperative relationships are: between the nut, the ferrule, and the receiving piece in cooperation with the tattoo machine elements.

The applicants have amended claim 1 such that it contains essential structural cooperative relationships between the elements. This amended claim 1 does not contain new matter and is supported by the substitute specification filed with this response. As amended, claim 1 clearly sets forth the structural cooperative relationships, and applicants respectfully request that the rejection under 35 USC § 112, second paragraph, be withdrawn.

III. DRAWINGS

The applicants acknowledge the Examiner's statement that the formal corrected drawings, filed on October 11, 2002, have been approved.

IV. CLAIMS

A. CLAIM AMENDMENTS

In accordance with the Flyer entitled: "*Revised Notice* AMENDMENTS MAY NOW BE SUBMITTED IN REVISED FORMAT*, applicants submit with this Amendment, a single marked-up version of the claims. As the requirement for a clean version is eliminated, applicants do not submit a clean version of the claims.

B. CLAIM REJECTIONS

The Examiner rejected claims 1-15 of applicants' invention. Specifically, the Examiner rejected claim 12, under 35 USC § 102(b) as being clearly anticipated by U.S. Patent No. 3,972,547 to Itoya (the "Itoya reference"). The Examiner further rejected claims 1-11 and 13-15 under 35 USC § 103(a) as being unpatentable over U.S. Patent Nos. 4,204,438 to Binaris (the "Binaris reference") and 4,159,659 to Nightingale (the "Nightingale reference").

Applicants respectfully traverse these rejections based on the arguments set forth below. Applicants request that the Examiner reconsider her rejection of claims 1-15 based on these arguments as well as the arguments previously set forth by applicants in their October 11, 2002 response.

1. CLAIM 12: 35 U.S.C. § 102(B)

The Examiner rejected claim 12, citing 35 U.S.C. § 102(b), as being anticipated by the Itoya reference. Applicants respectfully traverse this rejection.

Specifically, the Examiner stated that:

> "Claim 12 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Itoya."

In order for the Itoya reference to anticipate claim 12, the reference must teach every element of the claim. *See* MPEP 2131. As set forth below, claim 12 has been revised to clearly delineate the novelty of the present invention over Itoya. Based on these arguments, applicants respectfully request that the anticipation rejection be withdrawn.

First, claim 12 of applicants' invention provides an elongated, hollow, and externally threaded cylindrical piece with a tapered internal surface. Conversely, the Itoya reference provides a locking member 14 that is a cylindrical block. *See* Col. 3, lns. 1-2. Because the Itoya reference is concerned with creating a sealed connection between two pieces of supported conduit for applications in which fluids passing therethrough will not leak, they provide a locking member 14 that is block in nature. The Itoya reference could not provide a locking member 14 cylindrical in shape, as a cylindrical locking member 14 would not properly seal with the holder 10 and base body 34. A cylindrically shaped locking member 14 would not prevent leakage of fluids, which is the one of the main objects of the Itoya reference. Applicants submit therefore, that the cylindrical piece disclosed in claim 12 of applicants' invention is not disclosed, and would not have been beneficial, if used, in the Itoya reference.

Second, applicants' invention provides for a split ring with smooth internal and external surfaces and beveled ends. The Itoya reference discloses an intermediate packing member 12. Unlike claim 12 of applicants' invention, the Itoya reference does not disclose an intermediate packing member 12 having smooth internal and external surfaces and beveled ends. Rather, the Itoya reference discloses an intermediate packing member 12 having an external thread (col 2, line 67).

Third, applicants' invention provides at least one nut that is adapted to screw *onto* the cylindrical piece of applicants' invention(emphasis added). When the nut is screwed onto said cylindrical piece, the split ring is compressed to grip a tube adapted to house at least one needle. The Itoya reference, on the other hand, provides a holder 10 that screws *into* the locking member 14 (Col. 3, lns 13-14; Figures 2, 4, 6, 8, 11, 14, 20, and 22)(emphasis added). Because the Itoya reference is concerned with creating a sealed connection between two pieces of

supported conduit for applications in which fluids passing therethrough will not leak, having the holder 10 screw into the locking member 14, instead of around the locking member 14, provides a more sealed barrier.

As stated above, the Itoya reference does not disclose the cylindrical piece, splint ring, or nut as disclosed in claim 12 of applicants' invention. Further, the application and construction of the conduit coupling device disclosed in the Itoya reference differs significantly from applicants' invention. In Itoya, the apparatus is designed to create a sealed connection between two pieces of supported conduit for applications in which fluids passing therethrough will not leak. The ferrule in applicants' invention is significantly modified from a ferrule-type disclosed in the Itoya reference. First, a portion of the ferrule has been externally threaded. Second, a ring of elastic material must be fit about the ferrule. Third, Itoya has made no consideration of such aspects as ferrule inner diameter, thread durability, or material thickness beyond that required for the intended application.

The applicants' invention, by contrast, has been designed, and was claimed, with a different application in mind, namely, for use in a tattooing device. First, the threaded rod is cast as part of the coil mounting bracket so that structure can tolerate any shearing stresses to the cantilever formed by the joining of the tube grip and threaded rod. The wall thickness of the tube and the threaded rod has also been increased to accommodate the cantilever. Second, the position of the threaded rod has been carefully considered since its location has impacts throughout the tattooing device. In particular, the required gauge of the rear spring (not numbered, but attached at the same point as spring 69) varies with the position of threaded rod 14. If the position of threaded rod 14 is moved outwardly, for example, the length of the rear spring must be increased. However, an increased spring length requires an increased metal

gauge in order to provide enough tension to move the armature bar. Third, the inner diameter of the threaded rod 14 has been chosen to optimally allow moving pieces to move unhindered and at the same time provide structural integrity to handle shearing stresses. Fourth, the mechanism has been simplified for the intended application; therefore, no elastic sealing material is required, nor must the ferrule be threaded. Finally, the materials and thread patterns have been selected to accommodate repetitive connection and disconnection of the tube grip 16.

Based on the differences cited above, applicants respectfully submit that the Itoya reference does not provide each and every claim element of applicants claim 12. Therefore, applicants submit that claim 12 is not anticipated by the Itoya reference. Applicants respectfully request that the Examiner withdraw her anticipation rejection.

2. **CLAIMS 1-11 AND 13-15: 35 U.S.C. § 103(A)**

The Examiner rejected claims 1-11 and 13-15, citing 35 U.S.C. §103(a), as being unpatentable over U.S. Patent Nos. 4,204,438 (the "Binaris reference") and 4,159,659 (the "Nightingale reference) in view of the Itoya reference. Applicants respectfully traverse this rejection.

In the December 23, 2002 office action, the Examiner stated:

> "Binaris et al or Nightingale disclose all of the claimed subject matter except for having a securing means in the form of a nut, a ferrule, and a receiving piece; a brass ferrule; a cast frame, and cutting using a computer controlled mill. Itoya discloses a securing means in the form of a nut, a ferrule, and a receiving piece. Itoya further discloses a split ferrule. It would have been obvious to one having ordinary skill in the art to form the connection of Binaris et al or Nightingale with a nut, a ferrule which may be split, and a receiving piece to provide removable parts as taught by Itoya.".

To establish a prima facie case of obviousness, there must be: (1) some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings; (2) there

must be a reasonable expectation of success; and (3) the prior art reference must teach or suggest all of the claim limitations. *See* MPEP 2142.

A. THE BINARIS REFERENCE IN VIEW OF THE ITOYA REFERENCE

First, applicants submit that there is no suggestion or motivation, in either the Binaris or Itoya references, to combine the tattooing device of the Binaris reference with the pipe joint device of the Itoya reference. The Itoya reference relates solely to a locking and nonseal pipe joint device for you in hydroulic arrangements. There is no suggestion in the Itoya reference that this device could be used with tattoo devices, and applicants submit that it would not have been obvious to those in the hydroulic arrangements industry to combine the pipe joint device of the Itoya reference with a tattoo device. Further, the Binaris reference is concerned with providing a tattoo device having a motor 32 secured within a motor housing 12 to reduce and quiet tattoo operations. The Binaris reference was not concerned with the mechanism by which the needle was attached to the tattoo device. Applicants submit that there is no suggestion in the Binaris reference to provide a tattoo device having a pipe joint device as disclosed in the Itoya reference.

Second, even if the Binaris reference were combined with the Itoya reference, applicants' invention would not be disclosed. Referring broadly first to the disclosure in the Binaris reference, it is noted that the construction therein differs fundamentally in structure from applicants' invention. The Binaris reference discloses an enclosed tattooing device in which a tattooing needle is connected to an eccentric drive structure that is driven by an electric motor. The eccentric drive structure, motor, and needle connection are housed within an enclosed cylinder. Ease of cleaning and disassembly is not a consideration in the Binaris reference.

In contrast, applicants' invention discloses a tattooing device with exposed components, which employs an armature bar driven by electromagnets to reciprocate a tattooing needle. The armature bar, electromagnets, and needle connection are exposed to permit easy cleaning and replacement of tattooing needles. Ease of cleaning and disassembly is the primary object of the subject invention.

The Itoya reference does not disclose the apparatus disclosed in applicants' invention. The application and construction of the conduit coupling device disclosed in the Itoya reference differs significantly from applicants' invention. In Itoya, the apparatus is designed to create a sealed connection between two pieces of supported conduit for applications in which fluids passing therethrough will not leak. The ferrule in applicants' invention is significantly modified from a ferrule-type disclosed in the Itoya reference. First, a portion of the ferrule has been externally threaded. Second, a ring of elastic material must be fit about the ferrule. Third, Itoya has made no consideration of such aspects as ferrule inner diameter, thread durability, or material thickness beyond that required for the intended application.

The applicants' invention, by contrast, has been designed with a different application in mind, namely, for use in a tattooing device. First, the threaded rod is cast as part of the coil mounting bracket so that structure can tolerate any shearing stresses to the cantilever formed by the joining of the tube grip and threaded rod. The wall thickness of the tube and the threaded rod has also been increased to accommodate the cantilever. Second, the position of the threaded rod has been carefully considered since its location has impacts throughout the tattooing device. In particular, the required gauge of the rear spring (not numbered, but attached at the same point as spring 69) varies with the position of threaded rod 14. If the position of threaded rod 14 is moved outwardly, for example, the length of the rear spring must be increased.

However, an increased spring length requires an increased metal gauge in order to provide enough tension to move the armature bar. Third, the inner diameter of the threaded rod 14 has been chosen to optimally allow moving pieces to move unhindered and at the same time provide structural integrity to handle shearing stresses. Fourth, the mechanism has been simplified for the intended application; therefore, no elastic sealing material is required, nor must the ferrule be threaded. Finally, the materials and thread patterns have been selected to accommodate repetitive connection and disconnection of the tube grip 16.

It is these considerations of the different design aspects such as shearing stresses caused by the cantilever of an unsupported conduit, wear due to repetitive reconnections, and inner dimension tolerances and wall thicknesses to accommodate rapidly moving objects passing within, which require inventive thinking.

Applicants respectfully submit that there is no suggestion or motivation to combine the Itoya and Binaris references. Further, even if the references were combined, applicants' invention would not be disclosed. Applicants submit that the differences in form and function between applicants' invention, the Binaris reference, and the Itoya reference are substantial, and applicants therefore submit that applicants' invention is not unpatentable over the Binaris reference in view of the Itoya reference. Applicants respectfully request that the Examiner withdraw her obviousness rejection.

B. THE NIGHTINGALE REFERENCE IN VIEW OF THE ITOYA REFERENCE

First, applicants submit that there is no suggestion or motivation, in either the Nightingale or Itoya references, to combine the electric marking device of the Nightingale reference with the pipe joint device of the Itoya reference. As previously discussed by applicants, the Itoya reference relates solely to a locking and nonseal pipe joint device for use in

hydroulic arrangements. There is no suggestion in the Itoya reference that this device could be used with tattoo devices, and applicants submit that it would not have been obvious to those in the hydroulic arrangements industry to combine the pipe joint device of the Itoya reference with a tattoo device. Further, applicants submit that the electric marking device of the Nightingale reference focuses on a plastic needle guide assembly holder provided with a bore 100 and headed screw 101. There is no suggestion or motivation in the Nightingale reference, to interchange the tattooing needle assembly with applicants' invention.

Second, even if the Nightingale reference were combined with the Itoya reference, applicants' invention would not be disclosed. Referring broadly now to Nightingale it is noted that the apparatus disclosed has several deficiencies or disadvantages with respect to the present invention. The Nightingale reference discloses that a primary object of the tattooing device is to enable the tattoo operator to easily change the tattooing needle assembly. In practice, however, servicing Nightingale is complicated by the number and size of the various connections. The process of servicing as disclosed by Nightingale is as follows:

1) Elastic bands (not shown) must be removed from the apparatus 10;

2) wing nut 97' must be loosened from pintle 97 so that holder 94 can be pivoted downwards;

3) needle assembly 17 must then be removed from needle guide assembly 16;

4) screw 101 must next be loosened;

5) needle guide assembly 16 must next be removed;

6) If cleaning of the needle guide assembly is necessary, set screw 90 must be removed; and

7) If it is necessary to change the needle 77, set screw 79 must also be removed.

There are potentially seven steps involved in the servicing the Nightingale apparatus. Additionally, a minimum of six pieces are involved, namely, the elastic bands, the wingnut 97', the pintle 97, needle holder block 75, set screw 79, and needle assembly 17. Yet further, tools are required to replace a needle. In practice, therefore, servicing Nightingale's apparatus is both time consuming and complicated.

By contrast, applicants' invention creates an apparatus that is extremely easy to disassemble and maintain. The process for disassembly in applicants' invention is as follows:

1) compression nut 12 must be loosened;

2) tube grip assembly 16 must be separated from compression nut 12; and

3) needle bar 24 must be removed.

Thus, to service applicants' invention, only three steps are required, and only four pieces are involved in the disassembly, namely, the compression nut 12, the ferrule 10, the tube grip 16, and the needle 24. Further, a needle in the subject invention can be replaced without tools. In practice, therefore, the subject invention is substantially less time consuming to service.

The applicants would further note that the needle guide assembly holder 94 of the Nightingale reference is made from plastic. It is well known that the constant stressing of plastic, as will occur when screw 101 is loosened and tightened, will result in it breaking. Even relatively durable plastics wear and break with constant usage after autoclave steam sterilization as temperatures exceeding 251 degrees Farenheit are used. The ferrule 10 and the nut 12 are the parts most often in contact with the tube 20 and are prone to contamination, thereby requiring

regular sterilization. By contrast, the subject invention uses only metal and is therefore significantly more durable.

It is submitted therefore that the subject invention clearly improves upon on the Nightingale reference and that the substantial inventiveness was required to simplify the apparatus disclosed in the Nightingale reference.

Referring broadly now to Itoya, it is noted that the application and construction therein differs significantly from the subject invention. In Itoya, the apparatus is designed to create a sealed connection between two pieces of supported conduit for applications in which fluids passing therethrough will not leak. The ferrule in applicants' invention is significantly modified from a ferrule-type disclosed in the Itoya reference. First, a portion of the ferrule has been externally threaded. Second, a ring of elastic material must be fit about the ferrule. Third, Itoya has made no consideration of such aspects as ferrule inner diameter, thread durability, or material thickness beyond that required for the intended application.

The applicants' invention, by contrast, has been designed with a different application in mind, namely, for use in a tattooing device. First, the threaded rod is cast as part of the coil mounting bracket so that structure can tolerate any shearing stresses to the cantilever formed by the joining of the tube grip and threaded rod. The wall thickness of the tube and the threaded rod has also been increased to accommodate the cantilever. Second, the position of the threaded rod has been carefully considered since its location has impacts throughout the tattooing device. In particular, the required gauge of the rear spring (not numbered, but attached at the same point as spring 69) varies with the position of threaded rod 14. If the position of threaded rod 14 is moved outwardly, for example, the length of the rear spring must be increased. However, an increased spring length requires an increased metal gauge in order to provide

enough tension to move the armature bar. Third, the inner diameter of the threaded rod 14 has been chosen to optimally allow moving pieces to move unhindered and at the same time provide structural integrity to handle shearing stresses. Fourth, the mechanism has been simplified for the intended application; therefore, no elastic sealing material is required, nor must the ferrule be threaded. Finally, the materials and thread patterns have been selected to accommodate repetitive connection and disconnection of the tube grip 16.

It is these considerations of the different design aspects such as shearing stresses caused by the cantilever of an unsupported conduit, wear due to repetitive reconnections, and inner dimension tolerances and wall thicknesses to accommodate rapidly moving objects passing within, which require inventive thinking. Respectfully, it is simply not a matter of connecting Itoya's ferrule apparatus to Nightingale's tattooing apparatus.

Applicants respectfully submit that there is no suggestion or motivation to combine the Itoya and Nightingale references. Further, even if the references were combined, applicants' invention would not be disclosed. Applicants submit that the differences in form and function between applicants' invention, the Nightingale reference, and the Itoya reference are substantial, and applicants therefore submit that applicants' invention is not unpatentable over the Nightingale reference in view of the Itoya reference. Applicants respectfully request that the Examiner withdraw her obviousness rejection.

3. **CLAIMS 2-8, 10-11, 14-15, AND 16**

Claims 2-8 and new claim 16 are apparatus claims dependent directly or indirectly from independent claim 1; and claims 10-11 are apparatus claims dependent directly or indirectly from independent claim 9. Applicants submit that the dependent claims are patentable for the same reasons as were discussed for claims 1, 9, and 13, and further in light of the further

limitations contained within the dependent claims. Claims 14 and 15 have been canceled and applicants submit that the Examiner's rejections are therefore null.

C. CLAIMS 17-35

The applicants have added claims 16-35 to this application. As claim 16 is dependent on claim 5, applicants have discussed the patentability of this claim in the above section.

Applicants submit that no new matter is added in these claims. However, to avoid possible objections or rejections to these claims, based on the references cited by the Examiner in the December 23, 2002 office action (the Itoya, Nightingale, and Binaris references), and to expedite the examination of this application, applicants respectfully submit arguments evidencing the patentability of new claims 17-35.

1. THE ITOYA REFERENCE

The Itoya reference does not disclose the apparatus disclosed in claims 17, or 33-35 of applicants' invention. The application and construction of the conduit coupling device disclosed in the Itoya reference differs significantly from applicants' invention. In Itoya, the apparatus is designed to create a sealed connection between two pieces of supported conduit for applications in which fluids passing therethrough will not leak. The ferrule in applicants' invention is significantly modified from a ferrule-type disclosed in the Itoya reference. First, a portion of the ferrule has been externally threaded. Second, a ring of elastic material must be fit about the ferrule. Third, Itoya has made no consideration of such aspects as ferrule inner diameter, thread durability, or material thickness beyond that required for the intended application.

2. THE BINARIS REFERENCE

The Binaris reference discloses an enclosed tattooing device in which a tattooing needle is connected to an eccentric drive structure that is driven by an electric motor. The eccentric drive structure, motor, and needle connection are housed within an enclosed cylinder. Ease of cleaning and disassembly is not a consideration in the Binaris reference.

In contrast, applicants' invention discloses a tattooing device with exposed components, which employs an armature bar driven by electromagnets to reciprocate a tattooing needle. The armature bar, electromagnets, and needle connection are exposed to permit easy cleaning and replacement of tattooing needles. Ease of cleaning and disassembly is the primary object of the subject invention.

3. THE NIGHTINGALE REFERENCE

The Nightingale reference discloses that a primary object of the tattooing device is to enable the tattoo operator to easily change the tattooing needle assembly. In practice, however, servicing Nightingale is complicated by the number and size of the various connections. The process of servicing as disclosed by Nightingale is as follows:

1) Elastic bands (not shown) must be removed from the apparatus 10;

2) wing nut 97' must be loosened from pintle 97 so that holder 94 can be pivoted downwards;

3) needle assembly 17 must then be removed from needle guide assembly 16;

4) screw 101 must next be loosened;

5) needle guide assembly 16 must next be removed;

6) If cleaning of the needle guide assembly is necessary, set screw 90 must be removed; and

7) If it is necessary to change the needle 77, set screw 79 must also be removed.

There are potentially seven steps involved in the servicing the Nightingale apparatus. Additionally, a minimum of six pieces are involved, namely, the elastic bands, the wingnut 97', the pintle 97, needle holder block 75, set screw 79, and needle assembly 17. Yet further, tools are required to replace a needle. In practice, therefore, servicing Nightingale's apparatus is both time consuming and complicated.

By contrast, claims 17 and 33-35 of applicants' invention create an apparatus that is extremely easy to disassemble and maintain. The process for disassembly in applicants' invention is as follows:

1) compression nut 12 must be loosened;

2) tube grip assembly 16 must be separated from compression nut 12; and

3) needle bar 24 must be removed.

Thus, to service applicants' invention, only three steps are required, and only four pieces are involved in the disassembly, namely, the compression nut 12, the ferrule 10, the tube grip 16, and the needle 24. Further, a needle in the subject invention can be replaced without tools. In practice, therefore, the subject invention is substantially less time consuming to service.

The applicants would further note that the needle guide assembly holder 94 of the Nightingale reference is made from plastic. It is well known that the constant stressing of plastic, as will occur when screw 101 is loosened and tightened, will result in it breaking. Even relatively durable plastics wear and break with constant usage after autoclave steam sterilization as temperatures exceeding 251 degrees Fahrenheit are used. The ferrule 10 and the nut 12 are the parts most often in contact with the tube 20 and are prone to contamination, thereby requiring

regular sterilization. By contrast, the subject invention uses only metal and is therefore significantly more durable.

4. CLAIMS 18-32

Claims 18-32 are apparatus claims dependent directly or indirectly from independent claim 17. Applicants submit that the dependent claims are patentable for the same reasons as were discussed for Claim 17, and further in light of the further limitations contained in the dependent claims.

V. CONCLUSION

Reconsideration of claims 1-13 and consideration of new claims 16-35 of applicants' invention is respectfully requested in view of the above amendments and remarks, and early notice of allowance thereof is earnestly solicited.

Please charge Deposit Account No. 13-3571 for any additional fees which may be required. A duplicate copy of this transmittal letter is enclosed.

Respectfully submitted,

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VERSION TO SHOW CHANGES

SCREW TIGHT TUBE VICE FRAME

~~BACKGROUND~~ FIELD OF THE INVENTION

[0004]_____ This invention ~~pertains~~ relates generally to the field of tattooing and tattoo machines. More particularly, the invention relates to an apparatus for securing, ~~and is intended to improve the method used to secure~~ the tube grip, which houses the needle bar and needle grouping, to the frame of a tattoo machine ~~frame~~or intradermal injection device. ~~The tube grip houses the needle bar that holds the needle grouping, which moves into and out of the skin in the act of tattooing.~~

BACKGROUND OF THE INVENTION

[0005]_____ Tattoo machines necessarily break the skin of the subject during the tattooing process, causing a risk of the spread of infectious diseases such as Hepatitis, HIV and AIDS. The standard in the industry therefore is to sterilize the tattoo machine before each use. ~~Because tattoos must be applied in a sterile manner,~~In order to effectively and efficiently sterilize a tattoo machine, the components of the machine must be easy to remove, sterilize, and reassemble.

[0005.1]_____ Prior art tattoo machines typically have a needle or needle grouping which extends through the tattoo machine frame and is driven by a motor to reciprocate linearly. A ~~the~~ hollow cylinder or tube is attached to the tattoo machine frame and the needle grouping passes through the tube. A portion of the tube, often having a larger external diameter than the rest of the tube, has a gnarled outer surface. This portion is called a tube grip. The tube grip provides a gripable portion

of the tattoo machine operator and also serves to guide the needle grouping and restrain lateral movement of the needle grouping. The tube grip and needle groupings must be removable to allow them to be cleaned and sterilized. On all modern tattoo machines, the tube grip is a removable part.

[0005.2] Existing ~~tube vice~~tattoo machine technology ~~uses~~ employs several methods to secure the tube grip to the tattoo machine frame which; ~~but many of these methods tend to bend or crimp the cylindrical tube grip.~~ tend to bend or crimp the cylindrical tube grip. The present apparatus available not only tend to damage the tube grip, but are slow to remove and reinstall, and apparatus with multiple small screws are difficult to sterilize.

[0005.3] A more recently developed method of attaching the tube to the frame is a split portion of the frame which partially encircles the tube and is tightened with a wing nut. Tattoo machines are covered with a light plastic bag during operation to avoid contamination or cross-contamination between the operator and subject. Not only are such bags often ripped by the protruding wing nut, but the tattoo machine is rendered less streamline by the frame extension, wing nut and bolt required. The wing nut type vice does not apply pressure evenly to the tube grip, and may result in bending or crimping of the tube grip.

~~The Screw-Tight Tube Vice Frame (shown in FIG. 2) is designed to allow the tube grip to be secured to the frame with a simple twist and released with a counter twist. The Screw-Tight Tube Vice Frame secures the tube grip in place just as securely as or more securely than existing technology, but will not bend or crimp the tube grip.~~

BRIEF SUMMARY OF THE INVENTION

[0006] ~~[0006]~~ It is an ~~The~~ object of the ~~Screw-Tight Tube Vice Frame~~present invention ~~is~~ to

provide a secure, easy to assemble and ~~dissassembled~~disassemble and streamlined apparatus for attaching ~~the~~ the tube grip and the tube housing needles in a tattoo machine to the frame of the tattoo machine in a manner that improves on the methods currently ~~used~~ employed by tattoo machines.~~,~~ ~~while providing a housing for the tattoo machine components.~~

[0006.1] It is a further object of the invention to provide a ~~The S~~screw ~~T~~tight ~~T~~tube ~~V~~vice ~~F~~frame ~~consists of a tube vice~~comprising a frame, ~~into which holes are drilled and tapped for attaching the frame to other tattoo machine components, and a tube vice mechanism for attaching the tube grip to the frame. This tube vice mechanism allows the tube grip to be secured to the frame with a simple twist, and released with a counter twist,~~ a compression nut, a compressible ferrule and a receiving piece and a tube adapted such that the tube housing at least one needle may be inserted in the receiving piece, the ferrule slipped over the tube, and the nut slipped over the tube and pushed up against the ferrule, then ~~and~~ screwed onto the receiving piece such that the ferrule is compressed and grips and retains the tube without bending or crimping it.

[0006.2] It is yet a further object of the present invention to provide a tube vice frame that allows rapid and easy removal of the ~~This is important because the~~ tube grip, tube and ~~with~~ needle groupings ~~is removed often~~ to allow for cleaning and sterilization. ~~and that has~~ It is a further object of the present invention to provide a tattoo machine with a streamlined profile that is easily shrouded in plastic or other material with~~out~~ tube vice frame which may risk of be retrofitted to existing tattoo machines tearing the shroud.

[0006.3] Another object of the present invention is to provide an apparatus for securing a tube grip to be secured to or ~~remaoved~~removed from a tattoo machine frame with a simple twist of a nut.

[0006.4] Another object of the present invention is to provide a method for manufacturing a screw tight tube vice frame that is efficient, inexpensive and creates a streamlined, easy to use vice frame on a tattoo machine.

BRIEF DESCRIPTION OF THE ~~SEVERAL VIEWS OF THE~~ DRAWINGS

[0007] FIG. 1 ~~shows the~~is a perspective view of a tattoo machine with ~~the~~ a ~~Screw~~ screw ~~Tight~~ tight ~~Tube~~ tube ~~Vice~~ vice ~~Frame~~frame according to the invention.

[0008] FIG. 2 ~~shows the components of~~is an exploded perspective view of the key components of the ~~Screw~~ screw ~~Tight~~ tight ~~Tube~~ tube ~~Vice~~ vice ~~Frame~~ frame in detail.

[0008.1] FIG. 3 is a pre-assembly side detail view of a compression nut, ferrule and threaded rod according to the invention.

[0008.2] FIG. 4 is an assembled side detail view of a compression nut, ferrule and threaded rod according to the invention.

DETAILED DESCRIPTION ~~OF THE INVENTION~~AND PREFERRED EMBODIMENT

[0009] ~~Components~~ Figure 1 depicts the preferred embodiment of the apparatus for attaching a tube 20 and associated components to a frame 40 in a tattoo machine 100 in accordance with the present invention. Tattoo machines 100 are generally comprised of a frame 40, typically made of metal.

Standard frames 40 have a lower binding post 52 and an upper binding post 50. There is also typically a coil mounting bracket 44 at the front portion of the frame 40, and a spring saddle 42 at the lower rear portion of the frame 40. At least one electromagnetic coil 60 is mounted on the coil mounting bracket 44. Preferably there are two coils, a front coil 60 and back coil 62. An armature bar 70 is attached to a spring 69 which extends from the spring saddle 42 and is adapted to reciprocate when AC power is applied to the electromagnetic coils 60 and 62 such that the armature bar 70 is alternately attracted and repelled by the coils 60 and 62, as is known in the art.

[0010] ~~[0010]~~ Also as is known in the art, a needle bar 24 is attached to the armature bar 70 and passes through the coil mounting bracket 44 to maintain stability. The needle bar 24 has at least one needle attached to the needle bar tip (not shown). A hollow housing or tube 20 is placed over the needle bar 24 to ~~g~~guide the reciprocating needle bar 24. The present invention relates generally to an apparatus for securing the tube 20 to the frame 40 of a tattoo machine 100, referred to herein as ~~T~~the ~~Screw~~ screw ~~Tight~~ tight ~~Tube~~ tube ~~Vice~~ vice ~~Frame~~ frame 30.

[0010.1] ~~Still referring to Figure 1, a~~A ~~consists of a tube vice frame and a tube vice mechanism, which attaches a tube grip of standard industry measurement to the frame. The tube vice mechanism may include a removable~~ hollow threaded rod ~~22~~ 14 extends from the mounting bracket 44 towards the active end- or front of the tattoo machine 100. The tube 20 is inserted into the hollow rod ~~22~~14. A ~~house the~~ compression ferrule (not shown) comprising a hollow split ring with bevelled edges is slipped over the tube 20 to abut the inner surface of the hollow rod ~~22~~14. A compression nut 12 with an internal taper is then slipped over the tube 20 to abut and surround the ferrule (not shown) and screw onto the rod ~~22~~14 thereby securing the tube 20 to the frame 40. ~~, or the hollow threaded section that houses the compression ferrule may be cast or machined as part of~~

~~the frame. The tube vice mechanism also includes a compression nut that is tightened around the compression ferrule to secure the tube grip to the frame, and loosened to release it from the frame. The specifications for the threaded rod and compression ferrule are as follows:~~

[0011] ~~[0011]~~ A tube grip 16 consisting of a hollow cylinder with a gnarled outer surface, which is a known tattoo machine component, is the slipped over the tube 20~~,~~ the tube grip 16 may also be an integral component of the tube ~~2~~620. A tube tip 18 is then inserted in the open end of the tube grip 16. At least one set screw ~~24~~ 26 is screwed through the tube grip 16 and into the tube 20 and tube tip 18, thereby connecting the tube tip 18, tube 20, and tube grip 16 as a unit.

[0011.1]———Referring now to Figure 2, an exploded perspective view of the key components of the screw tight tube vice frame are shown in detail. The tube vice mechanism, which is used to attach a tube grip of standard industry measurement to the frame, is located on the front lower portion of the frame. The frame 40 is shown fully exposed without the additional tattoo machine 100 components. The lower binding post hole 46 and upper binding post hole 48 are shown. In the preferred embodiment the hollow cylinder or rod 14 is removable from the frame 40. The inside surface of the rod 14 is tapered at both ends from a wider diameter at the ends to a smaller internal diameter at the end of the taper.

[0011.2]———The compression ferrule 10 is a split ring or hollow cylinder preferably composed of a malleable ~~material~~ metal such as brass. The ferrule 10 is tapered from each end to a central high point about the mid circumference of the ferrule 10. The ferrule 10 compresses as pressure is applied to the tapered ends such that the internal diameter of the ferrule 10 is reduced and the split or gap gradually reduced. The tapered ends of the ferrule 10 are preferable machined to the same angle

as the taper on the interior surface of the rod 14, such that a mirrored mating surface is created between the ferrule 10 and rod 14.

[0011.3] The ferrule 10 is compressed between the rod 14 and the compression nut 12, which is a nut having interior threads matching those on the exterior surface of the rod 14, and preferably has a gnarled or otherwise textured exterior surface to provide a grip to the operator. The nut 12 also has an internal taper matching or mirroring that of the ferrule 10. The compression nut 12 is rotated in a clockwise direction to compress and lock the ferrule 10 in place.

[0011.4] Optimally, the ~~threaded~~ rod 14 is between approximately 1/2" to 5/8" in length and has a~~: approximately 1/2" to 5/8" long, with~~ 1/2 20 threading, with an~~; the~~ inside diameter of ~~the hollow centre measures {fraction (either~~ 5/16)~~}~~" or ~~{fraction (~~11/64)~~}~~".

[0012] ~~[0012]~~ The compression ferrule 10 is optimally~~: usually measures~~ 1/4" ~~tall~~in length, with an inside diameter of ~~{fraction (~~5/16)~~)}~~" in an uncompressed state. The compression nut 12 must be sized to screw onto the rod 14.

~~[0013] Manufacturing and Assembly~~

[0014] ~~[0014]~~ The ~~Screw~~ screw ~~Tight~~ tight ~~Tube~~ tube ~~Vice~~ vice ~~Frame~~ frame components may be ~~made~~ manufactured from~~of~~ metal (such as aluminum, brass, steel, or iron) or any other rigid material (such as plastic, ~~fibreglass~~fiberglass, or lexan). Preferably a malleable metal such as brass is used. Holes are drilled in the tube vice frame 40 as follows:- a hole for the upper binding post , a hole for the lower binder post, two holes drilled in the coil mounting bracket to accept the screws 64 that secure the coils 60 and 62 and a

drilled and tapped hole for the spring screw 68 that secures the spring 69 to the frame 40.

~~[0017] two holes drilled on the flat plane~~coil mounting bracket to accept ~~for the screws 64 that secure the coils~~ 60 and 62 ~~(one hole per coil)~~ and a ~~[0018] drilled and tapped hole for the spring screw 68 that secures the rear spring~~ 69~~saddle to the frame 40.~~

~~[0019] The tube vice mechanism, which is used to attach a tube grip of standard industry measurement to the frame, is located on the front lower portion of the frame. It may include a removable hollow threaded rod to house the compression ferrule, or the hollow threaded section that houses the compression ferrule may be cast or machined as part of the frame.~~

[0020] ~~If a removable threaded rod is used to house the compression ferrule, a~~An internal taper is machined into the ~~lower~~ front entrance of the threaded rod 14, starting at the outside diameter and machining inwards to a ~~recommended~~ depth ~~of~~ which is optimally 1/8". The ~~entry to the~~ threaded rod 14 is tapered internally to approximately the same degree as the compression ferrule 10 to allow the rod 14 to house the ferrule10. The threaded rod 14 is optimally attached to the tube vice frame 30 by machining the coil mounting bracket 44 on the frame 40 as follows:

[0021]~~[0021]~~ 1. step-drilling a primary hole measuring ~~fraction (~~approximately 29/64~~)~~" in diameter ~~is step-drilled~~ two-thirds of the way into the front lower section of the coil mounting bracket 44~~frame ; drilling~~

2. drilling a secondary hole measuring ~~(fraction (~~approximately 5/16~~)~~" or ~~(fraction (~~11/64~~)~~" in diameter ~~is drilled~~ through the remaining one-third of the ~~frame~~coil mounting bracket 44~~,~~ using the same center point as the previous hole.

[0023] t The primary {fraction (29/64)}" hole is optimally tapped with a 1/2 20 bottoming tap from the entrance of the hole, starting at the bottom front of the coil mounting bracket 44frame and continuing through to the end of the step drilling (approximately two-thirds of the way into the coil mounting bracket 44frame).

[0024][0024] t The threaded rod 14 is screwed into the threaded hole (not shown) and optimally protrudes approximately a 1/2" from the front of the frame coil mounting bracket 44.

[0024.1] In a variation to the preferred embodiment, the removable hollow threaded rod 14 may be cast or machined as part of the coil mounting bracket 44 on the frame 40, rather than as a removable component.

[0025] [0025] If the hollow threaded section rod 14 is cast as part of the frame 40, it optimally protrudes approximately a 1/2" from the bottom front of the frame coil mounting bracket 44 (the same length as the threaded rod 14, described above, would protrude once screwed into the framecoil mounting bracket 44). If the frame 40 is cut on a CNC mill, the hollow threaded section rod 14 may also be machined into the frame 40, protruding approximately 1/2" from the bottom of the frame 40. (again, the same length as the threaded rod or cast threaded section would protrude from the frame). The same taper, preferably machined to a (recommended depth of 1/8") applies should be used whether a removable threaded rod 14 is used to house the compression ferrule 10 or the threaded rod 14section is cast or machined as part of the frame 40.

[0026] [0026] The compression ferrule 10 is preferablyusually made of a flexible or

~~malleable material (oftensuch as brass).~~ The exterior surface of the preferably brass compression ferrule 10~~It~~ is tapered on both ends; ~~and~~with the tapers meeting in the middle of the ferrule 10. A slit is made vertically through ~~half of~~ the ferrule 10 to allow flexibility when it is compressed and tightened around the tube 20~~grip~~. The compression ferrule 10 is placed into the hollow section of the threaded rod 14 or machined frame component 14.

[0027] ~~[0027]~~ The compression nut 12 is step drilled, drilled, and tapered to the same specifications as the threaded rod 14. It may be machined from any type of metal. The nut 12~~It~~ ~~is~~ has interior threads adapted to be screwed onto the threaded rod 14 or threaded section 14 of the frame ~~14~~ 40 that houses the compression ferrule 10 ~~with~~ by turning the nut 12 in a ~~tightening~~ clockwise motion to secure the tube ~~grip~~20, or ~~unscrewed~~ conversely turning the nut 12 in an anti-clockwise direction ~~loosening motion~~ to release the tube 20 ~~grip~~.

[0028] ~~[0028]~~ Referring now to Figure 3, a pre-assembly side detail view of a compression nut 12, ferrule 10 and threaded rod 14 is shown. The arrows indicate the direction of connection of the nut 12 to the rod 14. The tapered lip of the interior surface of the rod 14 serves to compress the ferrule 10 thereby reducing the interior diameter of the ferrule 10.

[0028.1] Figure 4 shows an assembled side detail view of a compression nut, ferrule and threaded rod. The compressed ferrule abuts the tube 20 with its interior surface, thereby securing the ferrule 10 in place without bending, crimping or other damage to the tube 20. ~~Function~~

[0028.2] In use, the sterilized, removable components are assembled as follows: the hollow rod 14 is screwed clockwise into the coil mounting bracket 44 on the frame 40, then the needle bar 24 is inserted through the frame 40 and attached to the armature bar 70. The tube 20 then slides over the active or distal end of the needle bar 24 and into the frame 40. The ferrule 10 slides over the tube 20 to seat against the distal end of the rod 14 and the compression nut 12 is tightened clockwise to compress the ferrule 10 against the tube 20 thereby retaining it in the frame 40. The tube grip 16 slides over the tube 20, and is secured by at least one set screw 26. The tube tip 18 is then inserted inside the distal end of the tube grip 16 and over the needle bar 24, and is secured to the tube grip 16 by at least one set screw 26.

[0029] ~~[0029]~~ When the compression nut 12 is turned clockwise in a tightening motion, the bevels or tapers make contact and slide over each other, creating pressure evenly around the circumference of the taper on the compression ferrule 10 and causing it to compress. The vertical slit in the ferrule 10 provides ~~greater room~~ a gap for compression as the ends of the slit move toward each other, creating a squeezing effect and securing the tube 20 ~~grip~~ to the frame 40 without bending or crimping it.~~.~~

[0030] ~~[0030]~~ After use of the tattoo machine 100, ~~Turning~~ the compression nut 12 is rotated counter-clockwise ~~in a loosening motion~~to relieves the pressure on the compression ferrule 10, resulting in the release of the tube 20~~grip~~. The motion is easy to perform and avoids damage to the tube 20 which commonly occurs in prior art tattoo machines 100. The present invention is a streamlined apparatus due to the low profile, inline ferrule 10, rod~~,~~ 14 and nut 12 arrangement.

[0030.1] The preferred embodiment and variations herein described are not intended to be exhaustive or to limit the scope of the invention to the precise forms disclosed. They are chosen and described to best explain the principles of the invention and its application and practical use to allow others skilled in the art to comprehend its teachings.

[0030.2] As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the spirit or scope thereof. Accordingly, the scope of the invention is to be construed in accordance with the substance defined by the following claims.

ABSTRACT

An apparatus ~~and a method for manufacturing the apparatus~~ is disclosed ~~for a tattoo machine frame with a screw tight tube vice~~ for attaching a needle housing or tube to the frame of a tattoo machine which facilitates cleaning and sterilization.. The apparatus, or tube vice, comprises a tube which houses ~~On all modern tattoo machines, the tube grip is a removable part that houses the needle bar, which holds the~~ ~~the~~ a needle ~~needle groupings that~~ which moves ~~into~~ and out of the subject's skin ~~in the act of~~ during tattooing, a hollow cylinder ~~which may be removable or integral to the frame of the tattoo machine~~, a split ring ferrule and a compression nut. The tube is inserted into the hollow cylinder and the ferrule slides over the tube ~~to abut the interior of the hollow cylinder~~. ~~Both t~~The ferrule, nut and ~~the interior of~~ the hollow cylinder have beveled edges ~~that match~~which mate. The nut slides over the tube to screw ~~i~~onto the hollow cylinder thereby compressing the ferrule against the tube without bending or crimping the tube ~~as generally occurs with the prior art~~. A~~The~~ tube grip may be attached to the tube. ~~The components of the tattoo machine are thereby rendered easy to remove and reassemble.~~ ~~and needle groupings must be removable to allow for cleaning and sterilization. The tattoo machine is also streamlined and less prone to parts puncturing protective coverings than prior art machines.~~A method of manufacturing the tube vice is also disclosed. The tube vice can be provided in kit format. ~~This invention is intended to improve the technology currently used by tattoo machines to secure the tube grip to the tattoo machine frame. Existing tube vice technology uses methods of securing the tube grip to the tattoo machine frame that tend to bend or crimp the tube grip. The Screw Tight Tube Vice Frame uses tube vice technology that secures the tube grip in place just as securely as or more securely than existing technology, but will not bend or crimp the tube grip. It includes a frame with holes drilled and tapped for attaching it to other components of a tattoo machine and a tube vice mechanism for attaching the tube grip to the frame. The tube vice mechanism allows the tube grip to be secured to the tattoo machine frame with a simple twist, and released with a counter twist.~~